

**DENDROCHRONOLOGICAL STUDY OF THE
HAMMERSTONE AND GALLOWAY BARN
HOLLAND TOWNSHIP, NJ**



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Introduction

At the request of the Holland Township Historic Preservation Commission a dendrochronological study was performed of the Hammerstone and Galloway Barns in Holland Township, Hunterdon County. The Hammerstone Barn stands at 133 Hawks-School House Road; Block 1, Lot 6. The Galloway Barn formerly stood at 622 Milford-Warren Glen Road, Block 6, Lot 61. It has been disassembled and is now in storage at the home of Adam Wengryn, 18 Pequest Road, Belvedere, NJ. Richard Veit carried out the sampling in November 2011 and January 2012. A total of three samples were taken from the Hammerstone Barn and five samples were taken from the Galloway Barn. Two of the three samples from the Hammerstone Barn could be dated, yielding dates of 1785 and 1787. Two the samples from the Galloway Barn could be cross dated; however, neither cross-dated against the Northern New Jersey Master and although they yielded dates of 1713 and 1720, these dates should be considered unconfirmed for reasons that will be elaborated upon below.

Alice Gerard analyzed the cores at the Tree-Ring Laboratory of the Lamont-Doherty Earth Observatory, a division of Columbia University. The cores from the Hammerstone and Galloway Barns were compared with master chronologies made from the cores in the collections of the Tree-Ring Laboratory. The resulting analysis revealed that the datable timbers employed in Hammerstone Barn were cut in 1785 and 1787. Two timbers from the Galloway Barn correlated weakly with the Philadelphia Master Chronology, yielding dates of 1713 and 1720. Although the samples were long enough that they would normally have yielded dates, the tree rings showed very little variation in width. In essence, they show complacent growth patterns which precluded dating the timbers.

Methods

Tree-ring dating and cross dating are essentially pattern matching of the variations in wide and narrow annual rings, wood density, or other ring characteristics resulting from variations in regional climate. The sampling was carried out using a one-inch diameter hollow-point drill bit mounted in a high-speed electric drill. All of the cores were taken from timbers that appear to be original components of the structure and had retained either their original bark or showed a waney edge, indicating where bark once had been. As the master or best dated chronologies for the northeastern United States are based on oak, whenever possible the cores were taken from oak beams. In some cases, such as where bark is missing, it is hard to determine the species of the tree before drilling. In sampling the Hammerstone and Galloway Barns, all of the samples were determined in the laboratory to be from oak timbers. The locations of the cores are noted below in the core catalog. In order to be dated cores must retain at least fifty growth rings. Four out of the five cores from the Galloway Barn had more than fifty rings, and three out of three rings from the Hammerstone Barn had more than fifty rings.

Once they arrive at the lab, the cores are aligned, glued to a frame, and sanded until the ring patterns show clearly. Measurements of ring widths are then recorded using a

staging microscope and computer. These measurements are compared with master chronologies made from dated beams in the same geographical area. This is done with specialized computer software. All of the cores are kept on file at the Tree-Ring Laboratory.

SAMPLE CATALOG

Hammerstone Barn

Sample #1, This sample was taken from a joist with a waney edge and had 164 rings. It dated strongly against several masters to give a final date of 1787.

Sample #2, This sample was taken from a joist with a waney edge and had 140 rings. Two masters gave no results and two others gave conflicting results.

Sample #3, This sample was taken from a joist with a waney edge and had 74 rings. It dated strongly against two masters to give a final date of 1785.



Figure 1: The Hammerstone Barn prior to restoration.

Galloway Barn

Sample # 1, This sample was taken from a tie beam with a waney edge. The sample had 73 rings. It did not cross date against any of the regional master chronologies.

Sample #2a and 2b, These two samples were taken from a post with a waney edge. One had 73 rings and the other had 64. Sample 2A cross-dated with the Philly master, but not the northern New Jersey master, to give a date of 1720 for the last ring. The fact that the sample does not match with the northern New Jersey master is puzzling.

Samples #3a and 3b, These two samples were taken from a post with a waney edge. One had 44 rings and one had 53 rings. Both were too short to date.

Sample #4, This sample was taken from a tie beam with a waney edge. It had 81 rings and didn't cross-date with any of the regional master chronologies.

Sample #5, This sample was taken from a tie beam. It also had a waney edge. Sample 5 had 65 rings and only cross-dated with the Philly Master, giving a date of 1713 for the last ring.



Figure 2: The Galloway Barn prior to dismantling.



Figure 3. A more recent photograph of the Galloway Barn prior to dismantling.

Interpretations and Conclusions

In summary, two of the three samples from the Hammerstone Barn were successfully cross-dated against established master tree-ring chronologies from the Northeast. These master chronologies included the Northern New Jersey Master, which is made up of cores dated from 1491 to 2001 from northern New Jersey, the Philadelphia Master, and the Hutchison Forest Master. The Philadelphia Master is based on dated cores from Philadelphia and the Hutchison Forest Master is based on an old growth forest in Somerset County, New Jersey. Because of regional variations in tree-ring widths, samples may also be dated in comparison with each other if there isn't a clear correlation with one of the master tree-ring chronologies. The two samples from the Hammerstone Barn cross-dated against multiple master tree-ring chronologies, and yielded dates of 1785 and 1787. The structure was presumably erected in or shortly after 1787.

The Galloway Barn is more puzzling. Only two of the five samples yielded dates, and only against a single master chronology. The dates were 1713 and 1720. These dates seem too early given the settlement history of the region. Moreover, all of the timbers sampled from the Galloway Barn showed minimal yearly variation, reducing the interpretive value of these dates. In interpreting these dates one must keep in mind that it is the wood component that is being dated, not the actual structure, since wood can be seasoned for several years before use, or reused from earlier structures.